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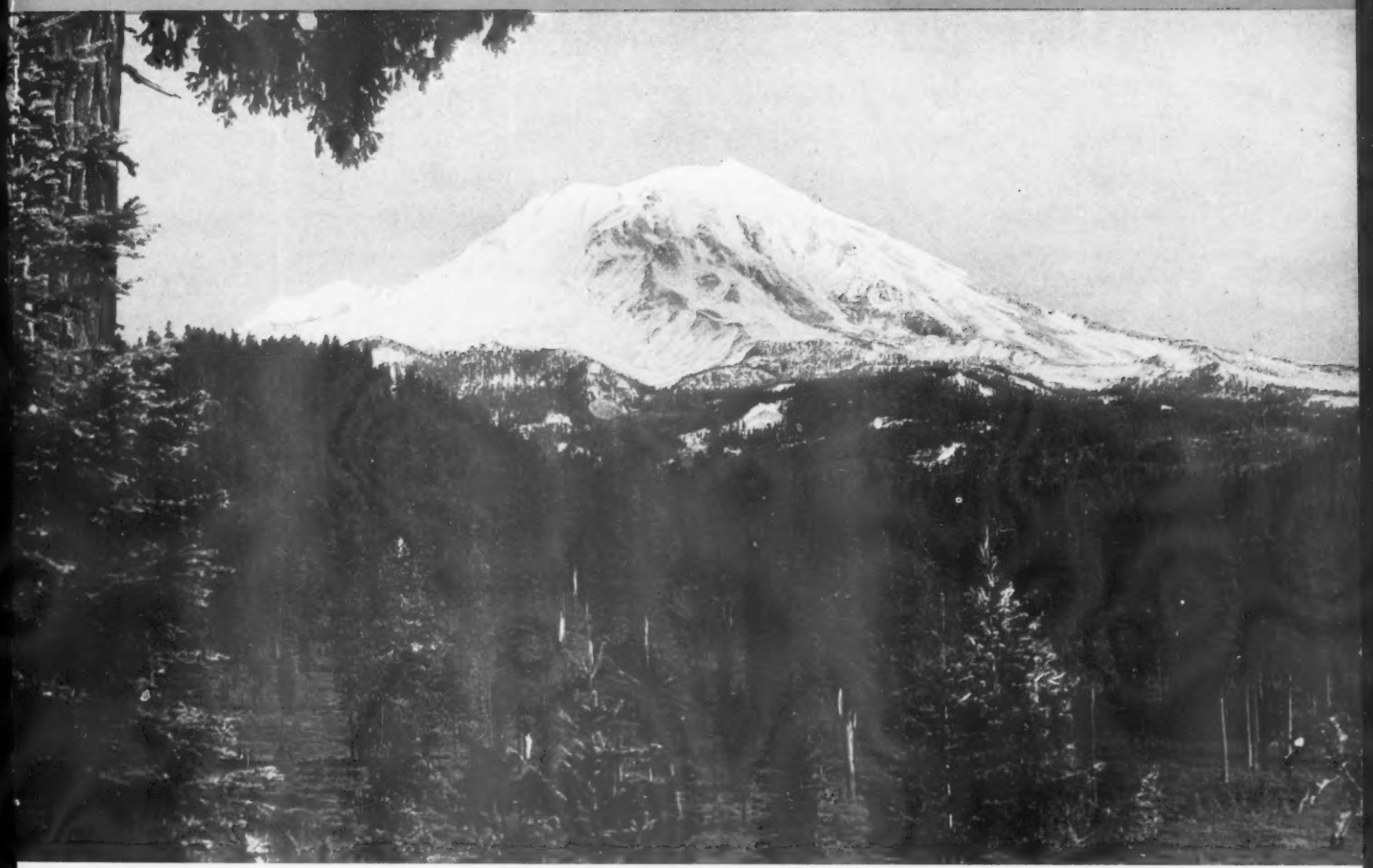

Mount Shasta

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★ *War on Blister Rust—by W. V. Benedict and T. H. Harris*

IMPORTANT SPRING SPRAYING—*by Frank B. Herbert* ★

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(See Inside Back Cover)

Along The Way

THE galloping Swede of Peck & Wadsworth, AL PETERSEN, did a lot of heming and hawing the other day about moving a client's "bohemian" tree. Easier to pronounce than Bauhinia, sez "Pete."

* * * *

A hillside planting of Monterey Pine, that have made a phenomenal 30 foot growth in seven years, are the pride and joy of CHAS. CAVANAUGH'S heart. The grounds of Charlie's Los Angeles Country Club have many small group plantings of Monterey Pine that show a wide and interesting variation in growth.

* * * *

"Ride 'em Cowboy"—no, not a rodeo, just the Society of American Foresters meeting in Los Angeles. Who was that cheerleader? Look at the picture over a few pages and somewhere near the center you will see a rather innocent looking figure (at the end of a table, center aisle). Looks rather bald, but isn't quite. Maybe he's getting ready to shake down a couple of pillars.

* * * *

Another one for the book—"Man, what a cow!"—he had plenty to say about cows and beefsteak—newcomer to the West, and he's HALL right.

* * * *

It's either HARV ANDERSON or me and the next time I meet that mountain "Barney Oldfield" I hope I'm going downhill. Our Topanga Canyon road is narrow and when Harv gets an S.O.S., that County Forestry buggy needs all of it.

* * * *

LESLIE MAYNE, new President of the Bay Counties Tree Surgeons—he with the charming English accent—good luck, Les, and make your V. P., VIC WELTZIN, put his shoulder to the wheel; you have a good gang back of you.

* * * *

When I first met E. I. KOTOK at the Society meeting in Los Angeles I wasn't quite prepared for a shock such as I received when lo! and behold! "everyone in the room was amazed when he stood up and sang song after song."

* * * *

Grand old man of "The Timberman"—Editor Emeritus, GEO. CORNWALL. He gave this budding editor some good pointers that will not be forgotten.

* * * *

Five yard BENEDICT! The terror from Nebraska. He and his fellow alumnus sure can make noise.

* * * *

O. R. BRISTOW, Park Super of San Berdoo, gets the orchids—he announced at the recent Park Administrators bi-monthly that his town opened its annual Orange Show on March 17th—as a faithful descendent of County Clare, I object.

* * * *

It's always a pleasure to me to meet MERRITT PRATT. A good "Joe" as the college laddies would say. He had some mighty interesting observations to recount from his recent trip through the East and South.

* * * *

Here's my chance to denounce you in public, McCLENAHAN. You must have a huge stack of unanswered mail if you treat all your admirers as you do me. Of course, it's just possible that Jim Farley has stopped shipping stamps to Big Stick town (Palo Alto is the botanic name) because of another famous person who lives there.

Oakland's park trees certainly look like the bustling, effervescent fellow who looks out for them—well, now I had better back up—the trees are beautiful, not that ED SANBORN isn't a good looking chap, but—. An intelligent spray program and fine equipment makes Oakland's arboreal display one of the sprightliest seen on a recent junket.

* * * *

HAMMOND SADDLER, genial architect of landscapes, is very serious about forming a business men's garden club in Southern California. The one in Oakland is highly successful and when attending a recent meeting there I was amazed to note the interest and earnest scribbling down of do's and don'ts. Go to it, Mr. Saddler; we're with you.

* * * *

Another great Pasadena Flower Show will take a bow April 1st continuing to the 3rd. It will be another super and can't miss with LOVELL SWISHER at the helm.

* * * *

DR. C. J. HUMPHREY called on me early this month—he brought a bad storm with him too—we had some interesting talks on fungi, and he did most of the talking. Doc is one of the country's leading authorities on dry-rot and fungi.

* * * *

See where DANA BOWERS, California Landscape Engineer, and GEORGE OTTEN, the same in Oregon, are on the Committee for Roadside Planting and Development of the American Association of State Highway Officials.

* * * *

A recent letter from FRANK ANDERSON, Park Super of Burlingame, telling of the annual banquet of the Peninsula Gardeners' Association, made me regret plenty that I was unable to accept their kind invitation to be among those present. Officers installed were: C. J. SCHROMM, president; JOHN SOUZA, vice-president; B. J. McCARRAN, secretary; E. W. POHLHAMMER, recording secretary; W. C. SCHROMM, treasurer; FRED AYLING, FRANK ANDERSON and STANLEY PITCHER, trustees. Go to it, boys!

* * * *

I feel very kindly toward JAMES STEVENS of the West Coast Lumberman's Association, and CLAUDE MARTIN of the Western Pine Association, for their ever-ready willingness to give a hand. They get out some right smart brochures, those boys; ought to sell plenty of lumber.

* * * *

PIERRE MILLER, pathologist at U. C. L. A., is digging in with all four feet on his new assignment of research in ornamental trees and shrubs. He's easy to get along with and as soon as he gets rolling we can expect some valuable information.

* * * *

FRANK BRISBIN and IRV TROEGER, Super and Assistant respectively, of the Santa Monica Park Department, put on a swell show for the recent bi-monthly of the California Association of Park Administrators. Wind, almost a tornado; rain, two degrees removed from being a cloudburst! Where was the thunder and lightning, boys?

* * * *

ED HOWARD of the Santa Monica Park Department displayed slides at the above mentioned meeting, taken 28 years ago in Cuba. Ed was on a palm and plant exploring expedition for the late Edward Doheny. Many of the boatload of plants he brought back are still thriving on the Doheny grounds in Sherman.

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OUR PLATFORM

1—State Arboreta.
2—Forest conservation and development.
3—Establishment and maintenance of Parks.
4—More playground and recreation areas.
5—Wholehearted support of the Western Shade Tree Conference.
6—Drastic enforcement of the wild flower and native plant laws.
7—Enthusiastic cooperation with the California Association of Park Administrators.
8—Correct planting and care of shade and ornamental trees.
9—Civic and state beautification.

Today and Tomorrow

THE very beautiful picture on our cover was obtained through the courtesy of M. H. Davis, Supervisor of Shasta National Forest, and Mr. Bennett of the Weed Studio, Weed, California. We are very grateful to these two gentlemen for their efforts and cooperation.

The first picture Mr. Davis sent was certainly a masterpiece, but because of its dimensions could not satisfactorily be made into a cut. We had the temerity to ask for another. The answer is this beautiful cover. *Gracias, Amigos.*

Incidentally, the finest news releases we have received from any National Forest have been the ones from Shasta. They are well written and illustrated by the choice of very pertinent and beautifully done photos. Wish the one describing the Christmas tree industry had come in a few weeks earlier; it would have fitted nicely in our December number.

* * * *

GOOD PEOPLE . . .

We are very grateful to the many good people who have shown what they think of *Trees, Parks & Forests*—they said it with dollars and after all, while the remuneration was welcome, the expressed approval of the journal was by far the most gratifying thing. Our first number was read far and wide. In addition to the complete distribution in the Western States, *Trees, Parks & Forests* found itself in thirty-five States; also in England, Australia, Chile, Hawaii and Alaska.

* * * *

TO BE OR NOT TO BE! . . .

Even the average American executive or administrator is an efficient cuss. Trying in every way to do his job thoroughly. This trait has made America great, it has also created some large and small controversial conditions.

The Federal Government in its efforts to give the average man in one of the isolated regions of the country an opportunity to enjoy some of civilization's luxurious necessities has trod on the sensitive toes of industry, big business or capital, call it what you will. One instance being the Tennessee Valley electrical junket—but every story has two sides.

This brings us to a case in our own back yard. Municipali-

ties have for years maintained their own nurseries in which they raise flowers, shrubs and trees for city parks and streets. Some Park Superintendents claim it does not pay. Others, that it does. One point brought out by the latter group contains much food for thought. The budgets of Park departments have to date been subjected to more vigorous wielding of the knife than perhaps that of any other department. Consequently, in order to keep up with the public's demand for beautiful flowers in parks and trees on streets it is absolutely necessary to raise these plants.

On the other hand, others claim that the cost of raising more than offsets any saving—while on the sidelines neither jeering nor cheering are the commercial nurserymen burdened with about 275 varieties of taxes (the same as the number of varieties of Eucalypti) and who would all like a part of this municipal business.

There is this to be said in summation—when new roads are needed, cement, etc., is purchased from a concern manufacturing this commodity; when gasoline and oil are needed the city does not build a refinery, therefore, it would seem that if the public demands beauty they should help the Park Superintendent in his fight for a budget adequate for the demands made—these points should be seriously considered by the Mayors of all municipalities.

* * * *

BUGS BEWARE! . . .

One of the most important steps in the progress of Southern California horticulture and arboriculture came with a recent announcement from the University of California.

Dr. Ralph H. Smith, entomologist, and Professor Pierre Miller, pathologist, both at the University of California at Los Angeles, have been given this all important assignment. Their time will now be devoted to research in the diseases and insect pests of ornamental trees and shrubs.

The Western Shade Tree Conference since its inception has undoubtedly shown the way toward the realization of the need for this important work and members in Southern California can feel assured that this long neglected job is in very capable hands. The value of this work will soon become manifest. The home owners of California comprise its greatest "industry" and to date the job of treating diseased trees and shrubs that embellish their homes, has been accomplished, after a fashion, without aid of science. That period is past.

* * * *

GOD'S GRANDEST GARDEN . . .

"An Arboretum is Born"—to steal a headline from our last issue, however, we must change slightly to "An Arboretum Will Be Born."

Prominent civic leaders and horticulturists of Southern California have become greatly interested in the movement sponsored by the Western Shade Tree Conference and supported by *Trees, Parks & Forests* to establish here the world's finest Arboretum.

Of the climate and location in Southern California for an Arboretum, the late Ernest H. Wilson, great plant explorer for the Arnold Arboretum in Brookline, Mass., said in his book, "Aristocrats of the Garden":

> "In California the trees and shrubs of the temperate zone of the Southern Hemisphere thrive amazingly, and it is probable that in this State alone a greater variety of woody plants can be successfully grown than any similar area in the world. I mentioned the Southern Hemisphere, but it should be added that the trees and shrubs of China, Japan, the Himalayas, Southern Europe, the Caucasus and the Mediterranean region of Northern Africa are equally at home in California."

This could mean only one thing—the finest Arboretum in the world. What a grand opportunity to give California another "first."

Arboreta and botanic gardens have been tried here, but none has survived, for the simple reason that they had not been properly set up. The only workable plan is that which is functioning for other institutions throughout the country. A complete working plan has been outlined by the Arboretum Committee of the Western Shade Tree Conference and appears in the Proceedings of the third conference. This Committee is made up of L. Glenn Hall, chairman; Theo. Payne, Gilbert L. Skutt, Ralph D. Cornell, William Hertrich, Hugh Evans and Maunsell van Rensselaer.

Arboreta are as old as time, principally because of man's close alliance with, dependence upon and the desire to learn more of trees and tree products. The lay person, however, has probably never heard of the word Arboretum, so we find it defined as: "A collection of trees and other woody plants (shrubs) used for scientific, educational and esthetic purposes."

Someplace between Santa Barbara and the Palos Verde Hills, within two miles of the ocean, lies unknown, the world's greatest tree garden. It should consist of about 1200 to 1500 acres of rolling land and some rugged land.

Somewhere perhaps there is a person or persons who would like to start this great project with a grant of land. A glorious monument this would be!

Edward H. Scanlon

OFF THE BULLETIN BOARD

A unique method of transplanting large trees was tried as an experiment and successfully carried out by C. E. Nelson, Supt. of Grounds at the University of Florida. The experiment was suggested by Dr. Heath of the Chemistry Dept.

On March 18, a large water oak tree, 24 inches in circumference and 30 feet high, was selected for the experiment. At this time the sap was rising rapidly and the tree had made much new growth, which was an unfavorable time for transplanting. The temperature was 81 degrees Fahrenheit in the shade, and the sun was shining particularly bright.

Owing to the height of the tree, and the inability to procure a tarpaulin to cover it completely, it was necessary to prune the tree to a height of 18 feet. The tarpaulin was placed over the tree and made as airtight as possible, then the tree was given a 125 ml. dose of ether.

The tree was left covered for two hours, then carefully dug up, the usual precautions being taken to prune the roots correctly, etc. After the tree was lifted it was moved a quarter-mile by truck, then replanted and given an abundance of water.

The ether seems to have stopped the transpiration rate so effectively that the tree has suffered no ill effects from the experiment, has continued its new growth and is doing fine after two years' observation.

COMING EVENTS

Fifth Western Shade Tree Conference, Hotel Senator, Sacramento, Calif., April 28-29.

California Conservation Week, Miss Pearl Chase, general chairman, 209 E. Canon Perdido, Santa Barbara, Calif., March 7-14.

Pasadena Flower Show, Lovell Swisher, manager, Civic Auditorium, 300 E. Green St., Pasadena, Calif., April 1-2-3.

California Spring Garden Show, Oakland, Calif., April 7-8-9-10.

California Association of Park Administrators, Long Beach, Calif., April 8.

Southern California Association of Foresters and Fire Wardens, Pomona, Calif., April 14-15-16.

Threat to Western Pines

By WARREN V. BENEDICT
and T. H. HARRIS
Bureau of Entomology and Plant Quarantine, U.S.D.A., Oakland, Calif.

WHEN our forefathrs settled this country, they found here vast expanses of virgin forests the equal of which the modern world will never see. Agriculture, lumbering, fire, disease and insects have taken their toll of these forests through 300 years until now less than one-fifth of the original forested area remains in virgin timber. Tree diseases have played and are playing a leading role in this story of depletion. As diseases of the white man preyed upon the Indians, wiping out entire communities and even tribes, so tree diseases that have reached America from foreign lands are threatening with extinction some of the country's finest commercial trees. The chestnut blight which has practically removed the chestnut from the eastern landscape has been one of these disastrous importations.

Sixteen years ago pathologists discovered in the West (British Columbia) one of the most deadly of these foreign tree diseases, white pine blister rust, a native of Asia. Blister rust is a parasitic fungous disease of white pines, America's most valuable commercial pines; it is a plant organism akin to the rusts attacking wheat and other grains—it is not an insect. In the East where blister rust has been present for 40 years, the northern white pine is attacked; in the Pacific Northwest and the Inland Empire the famous Idaho white pine is the victim; and in California the valuable sugar pine is the principal economic host.

Last year blister rust was discovered in California in Siskiyou and Del Norte Counties; it had apparently made its way into the State from the north about five years before. This year it was found generally distributed in the northern counties as far south as southern Trinity County in the Coast Range and Lassen Volcanic National Park in the Sierra Nevada.

An Empire at Stake

Just what is at stake in California? Sugar pine, largest of the world's pines, is the queen of the lumber industry in the Sierra Nevada. Commercial sugar pine forests extend in an almost unbroken belt from the Oregon border southward in the Sierra to about 60 miles below Fresno, and large areas of sugar pine are found in the Coast Range as far south as Lake County. If they were to be destroyed, the lumber industry would lose one of its most valuable resources.

Sugar pine grows at elevations ranging from 3,000 to 6,000 feet, the same elevations, incidentally, at which most of the recreational centers of the State are located. Three and one-half million acres of forest land in California support sugar pine, of which about two million acres produce pine in sufficient amount to be considered a major forest type. Within this type, according to a most conservative estimate, are some 15 billion board feet of merchantable sugar pine valued at about $50,000,000.

—*Bureau of Entomology and Plant Quarantine, U. S. Dept. of Agriculture*

Large spore producing canker on a young white pine infected with blister rust

This does not include the value, difficult to estimate but none the less real, of the immature pine trees which must be depended upon to form the future sugar pine crop, nor does it include the value of the forest as a watershed, game reserve, or simply as a place for the outdoor lover to spend his vacation. These represent additional millions of dollars.

How does blister rust work? Just as some human diseases are carried or harbored by other animals and are transmitted from them to man, so white pine blister rust is carried by certain plants other than pines. These carrier hosts are currant and gooseberry bushes both wild and cultivated. On the currants and gooseberries (or Ribes), the disease attacks the leaves only, and little damage is done to the plants.

On the pines, however, its primary host, blister rust works havoc; there it is a virulent bark disease living in the inner bark of the branches and trunk until they are girdled, and the tree dies of starvation. Cankers on the diseased parts of the tree are the outward signs of attack. Small trees are killed in a few years, larger ones more slowly.

Spread of Disease

How does blister rust spread? It is carried between the pines and the currant and gooseberry plants by means of wind-borne spores. The spores produced on the pines are capable of infecting only currants and gooseberries; they are long-lived, and when blown by the wind, may spread the disease as far as 200 miles from the parent tree.

The pine-infecting spores produced on the currants and gooseberries are short-lived and, under average forest conditions, cannot spread the disease to pines for more than 1000 feet. Two different host plants are thus necessary to the existence of blister rust. It cannot spread directly from pine to pine but must alternate between the pine and the currant or gooseberry bushes, first living on one and then the other.

What will happen if blister rust goes unchecked? As is frequently the case when a foreign disease becomes established in a new region and finds conditions favorable for its development, the native hosts have no effective resistance and quickly succumb. This is obviously the case with our native 5-needled pines. Although sugar pine has persisted in California throughout the centuries, this foreign disease will destroy it if allowed to spread unchecked.

Many sugar pines in northern California were this year subject to infection as a result of the large number of diseased currants and gooseberries present in the northern part of the state. Spores from the Ribes have by now unquestionably reached many pines. This represents the first stage in the development of an epidemic.

The disease will now undergo an incubation period of from two to three years in the pines before there is any evidence that the pines are infected. After the incubation period the disease will break out on the trees, cankers will appear on the branches, and spores from these cankers will be liberated by countless millions. These spores then infect Ribes in the surrounding country, only this time infection will be general and heavy because of the large volume of Ribes-infecting spores released by the diseased pines nearby.

This represents the second stage in the development of an epidemic. From this period on, continued southward spread and local intensification will be rapid, for blister rust builds up at a geometrical rate, and within several years an epidemic may be expected. This is the third stage, and in this stage pine damage and loss will be evident and will steadily continue until the disease has spread throughout the range of sugar pine.

Rust is a Scourge

Blister rust kills white pines of all sizes. The smaller the trees, the more quickly they die. The rapidity at which the trees are killed depends upon the size of the tree and the

(*Continued on Page* 14)

Pickens' Burn a Lesson

75th Congress
3d Session

IN THE House of Representatives, January 24th, 1938, John F. Dockweiler, Congressman, Sixteenth District, introduced the subjoined bill (H.R. 9121) which was referred to the Committee on Appropriations:

Providing for an appropriation for reforestation and water conservation through the retardation of water flow and the control of erosion on watersheds as contemplated by section 2 of the Act of June 22, 1936 (49 Stat. 1570), section 701b, title 33, United States Code, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there be, and is hereby, appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $750,000 to reforest or revegetate denuded lands; to protect, develop, and improve the natural cover of watersheds; to construct and maintain upstream engineering devices for the conservation of water and regulation of stream flow; and to develop such other measures as may be necessary for run-off and water-flow retardation and soil erosion prevention on water-sheds within the Angeles, Los Padres and San Bernardino National Forests in the State of California in accordance with Section Two of the Act of June 22nd, 1936.

By CLARK H. GLEASON
California Forest and Range Experiment Station

FOUR years ago the cities of Glendale, Montrose and La Crescenta were ravaged by a major flood. Today its traces are hardly discernible because of efficient rehabilitation and Nature's kindness in covering earth scars. The picture has become mercifully dim even in the minds of those who suffered the experience, while to the general public it is just another flood without special significance, now quite forgotten.

One wonders how well we have learned the lessons of that disaster, and whether we have fully prepared ourselves against a repetition of the catastrophe.

Acknowledged cause of the Montrose flood was the forest fire that denuded Pickens and adjacent canyons, just above the beleagured cities. The fire swept less than 5000 acres of watershed, a small area as forest fires go, yet debris flows wrought destruction valued into millions of dollars in the nearby metropolitan area. What steps have been taken to guard against future occurrences of this nature,

To Entrap Debris

First, in March, 1934, leading engineers and foresters met under the auspices of the Conservation Association of Los Angeles County, to consider that particular flood and to discuss its causes and preventive measures. The Los Angeles County Flood Control District and the United States Engineer Corps have since cooperated in building engineering works to protect this particular area from further danger. Tremendous basins have been scooped out to entrap debris of future floods at the canyon mouths. These are strategically situated directly in the channels which those floods must follow. Below these basins adequate concrete-lined storm drains are now in place to carry the desilted overflow harmlessly toward the sea. Millions of dollars have been invested in these two projects alone to insure future safety for the endangered area.

Recovery of vegetation on the fire-seared mountains has continued apace, until now the passing motorist can hardly distinguish the burned area.

Recovery of the Pickens burn has been materially hastened by engineering and forestry practices. Natural recovery of the chaparral has been speeded, while foothill communities have been adequately safeguarded against flood damage.

Need Added Safeguards

Public agencies charged with administration and protection of this area have functioned perfectly to the extent of their means, and everything possible is being done through superlative fire suppression and flood control organization to prevent such occurrences in the future, not only here but all along the San Gabriel Mountain front.

Yet two more safeguards must be arranged before full preparedness can be claimed, namely:

(1) To assure, through appropriate county and city zoning ordinances, that habitation of naturally habzardous areas will not be permitted until *after* fully adequate steps have been taken to nullify the hazard, and

(2) To make certain that, in already inhabited areas of known potential flood hazard, it shall become the duty of some specified and competent agency to give ***warning*** of danger when emergencies arise elsewhere.

—Photo by C. H. Gleason, courtesy U. S. Forest Service

Zoning would have prevented this and reduced suffering during the Montrose flood

House of Representatives

Washington, D. C.

Mr. Edward H. Scanlon, Editor,
Trees, Parks & Forests,
Santa Monica, California.
Dear Mr. Scanlon:

It afforded me much pleasure to learn from your recent letter that Western Trees, Parks & Forests was interested in H. R. 9121 introduced January 24th, last, providing for an appropriation for reforestation and conservation in the Angeles and San Bernardino National Forests.

This is a meritorious bill and one which I am sure will warrant the support of all who recognize the need of reforestation and water conservation. It is said that trees are the mothers of rivers and it behooves the people of California to arouse themselves and get solidly behind any sane proposal whose aim is to save our trees and thus guard the water supply so necessary to our soil.

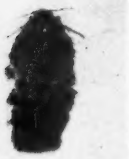
Always with every good wish and kindest personal regards, believe me to be

Faithfully yours,
JOHN STEVEN McGROARTY

Moths Invade Play Area

By J. E. PATTERSON
Associate Entomologist, U. S. Dept. of Agriculture, Berkeley, Calif.

DEFOLIATING insects are important enemies to many of our native park and shade trees, and they annually take heavy toll in recreational areas, where their depredations are particularly objectionable. Several of these insects have well - defined infestation cycles and are abundant only at periodic intervals.



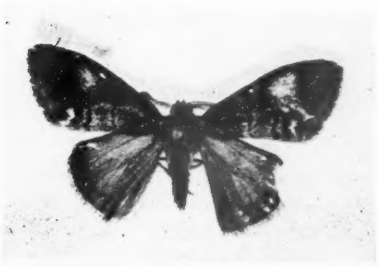
Oslar's tussock moth, *Hemerocampa oslari* Barnes, is one species of this group which occurs in epidemic form at infrequent intervals in the central Sierra region, where it attacks and defoliates fir and pine trees. A recent appearance of this moth in the Mammoth Lakes region of the Inyo and Mono National Forests on the east flank of the Sierra bids fair to cause considerable damage to the forest cover in this important recreational area unless the epidemic is of short duration.

This infestation was first noticed by entomologists in the fall of 1936. Feeding caterpillars were found on four widely separated areas, each containing from 1,000 to 2,500 acres. The condition of the infested trees showed that they had been partially defoliated the preceding summer, indicating that the first heavy feeding occurred in 1935, and dating the beginning of the epidemic in 1934. The brood of 1937 was far heavier than that of any of the preceding three years, but was still centered in the same areas.

The concentration of a high caterpillar population in 1937 on trees which had been partly defoliated the preceding two years resulted in a great stripping of their needles. Many trees were completely defoliated. The extent of defoliation on individual trees varied within wide limits, but practically all attacked trees had lost most of the needles of the upper crown. The loss of 75 per cent or more of the foliage results in an abrupt cessation of ring growth, and it is doubtful if such trees will survive.

—*Pictures on this page by J. E. Patterson, courtesy U. S. Dept. of Agriculture*

(Above) *Fully grown Oslar's tussock moth feeding on white fir needles* (Upper left) *Adult female.* (Lower left) *Male.*



Increment measurements show that the ring growth of 1937 was subnormal on all trees exhibiting up to 50 per cent defoliation and was entirely missing on completely defoliated trees. A high degree of injury was registered on defoliated tips and on main terminals in 1936, and many more died in 1937. Even if no further feeding occurs, this epidemic will already have resulted in many dead tops and lateral branches.

In this infestation the preferred host is white fir, *Abies concolor,* but Jeffrey pine, *Pinus jeffreyi,* is also attacked where it occurs in an infested area. Red fir, *Abies magnifica,* has not been attacked, although it is present in some of the infested white fir stands.

The infestations of this moth have not spread far from the original centers during the three years of their existence.

Wilt disease became epidemic in the brood of 1937 and accounted for a high mortality in the prepupal caterpillars. This condition, together with an abundance of specific parasitic insects present during the 1937 season, may portend an early decline of the current epidemic.

Shade Tree Gathering Set

WITH a resounding whack of his new gavel, a memento from Past President George K. Freeman, Fred Evans, Park Superintendent of Sacramento and President of the Fifth Annual Western Shade Tree Conference, will open the sessions of the conference at 10:00 a. m., April 28th, in the Hotel Senator at Sacramento.

One of the important round-table discussions will revolve about the important subject of preparing a bill for the next session of the legislature to regulate the practice of arboriculture in California.

The conference opens with papers on the Dutch Elm disease from two Morristown, N. J., visitors, Dr. May and E. G. Brewer.

The use of trees and shrubs for erosion control will have a well-qualified discussion leader in the person of Mr. H. Dana Bowers, State Landscape Engineer of California.

Miss Pearl Chase, Chairwoman of the California Conservation Week, will give a talk, "Conserving the Trees We Have." Miss Chase is to be the only woman speaker at the Conference.

With sight-seeing trips about the city and surrounding country and many informal discussions in the making, the Conference promises to exceed any of the preceding both in members in attendance and interest. The annual proceedings will be published after the meeting.

Safety for Tree Workers—Number 8 in the excellent Tree Preservation Bulletin series by A. Robert Thompson, Forester of the National Park Service. This bulletin of 30 pages, very appropriately illustrated, is the most complete detailed writing on the subject to date. A limited number are available at 10 cents per copy from the Superintendent of Documents, Washington, D. C.

❖ OFFICIAL PROGRAM ❖

Thursday, April 28th

8:30. Registration.

10:00. "The Dutch Elm Disease in the United States and its Insect Vectors," by Dr. Curtis May and Mr. C. W. Collins, U.S.D.A., Morristown, N. J.

10:15. "Eradication Methods for Dutch Elm Disease," by Mr. A. J. Brewster, U. S. D. A., Morristown, N. J.

10:30. "The Penicillium Disease of Ornamental Palms," by Dr. Donald E. Bliss, Citrus Experimental Station, Riverside, Calif.

11:00. "Diagnosis of Pathological Tree Disorders," by Willis W. Wagener, San Francisco, Calif.

11:15. "Other Species of California Cupressus as a Substitute for C. Macrocarpa," by Dr. Carl B. Wolf, Rancho Santa Ana Botanic Garden.

12:00. Luncheon in conjunction with Rotary Club at Hotel Senator. Speaker, Ralph D. Cornell: "The Proper Use of Acacia Trees."

2:00. "Studies on Susceptibility of Shade Trees to Destructive Agencies," by Dr. Aaron Gordon, California Forest & Range Experiment Station.

2:20. "Ten Important Eucalypts and Their Uses," by Theodore Payne, Los Angeles.

2:45. "The Need for Municipal and County Spraying," by Frank B. Herbert.

3:15. D. B. Mackie, State Dept. of Agriculture.

3:30. Business Session and Election—members only.

4:15. Dr. E. O. Essig, University of California.

Banquet—Hotel Senator.

Entertainment—Sacramento Convention Bureau.

Speaker, L. D. Tilton, State Regional Planning Director: "City Planning and the Tree."

Motion Picture by Los Angeles Park Dept. (sound and color): "A Tour of Los Angeles Beauty Spots."

Friday, April 29th

10:00. "The Use of Trees and Shrubs in Erosion Control," by T. B. Plair, Soil Conservation Service, Santa Paula. Discussion Leader, H. Dana Bowers, State Landscape Engineer of California.

10:45. "Tree Planting Problems in Large and Small Communities," by Fred Roewekamp, Park Engineer, Los Angeles Park Dept. Discussion Leader, Edgar M. Sanborn, Park Forester, Oakland Park Dept.

11:00. Round Table Discussion on the Subject of Preparing a Bill for the next session of the legislature to regulate the practice of arboriculture in California.

12:00. Luncheon with Lions Club, Hotel Senator.

Speaker, Miss Pearl Chase: "Conserving the Trees We Have."

Motion Picture, courtesy Peck & Wadsworth: "Going Places With Trees."

As to Spraying in Spring

By FRANK B. HERBERT
Entomologist, Balfour, Guthrie & Co., Ltd.

THERE are probably more pests attacking shade trees in the West than in any other section of the country. In the spring there are many kinds of caterpillars ready to devour the foliage of oaks and other trees soon after the new growth starts. At this time beetles are ready to defoliate elms and alders. Scale insects have already been sucking life from the trees, but attack them with renewed vigor when sap begins flowing up into the twigs. Aphids and lacebugs join in this pumping operation. Thrips and red spiders will soon start scarring the leaf tissues of some of our finest foliaged trees.

A simple procedure of spraying with a poison or contact insecticide will control most of these pests. Certain species can be sprayed during the dormant period, but the bulk of them should be treated in the spring.

Anyone who takes care of a garden realizes that most of his spraying is done at this time when the first warm days of the year are waking the plants and their hosts of insect enemies into activity. In the garden it is comparatively simple to mix up a little spray in a bucket and pump it onto the plants or still simpler to attach a bottle of spray and nozzle to the garden hose, turn on the water hydrant and drench the pests.

The trouble with the pests on shade trees is that they are so far out of reach that it is hard to realize they are present until the branches become black and sticky or until the honeydew drops onto the walks or autos beneath. The leaves may become yellow and ready to drop before the owner realizes there is something wrong. He may then climb up to discover them infested with red spiders or thrips. Even whole branches may be virtually dead before they are found to be encrusted with a heavy infestation of scale insects.

After discovering that they need spraying, the next problem is how to treat them. It isn't as simple a procedure as in the garden unless the trees are small. One may know what to apply but procuring the necessary equipment for its application is another matter. There are very few spray machines available with enough capacity and working pressure to do a satisfactory job. They won't reach the taller trees. Where elms or pines are infested it may be necessary to spray more than one hundred feet above ground in order to reach their tops. This requires a machine able to pump more than twenty, preferably fifty gallons per minute, and maintain a pressure of five or six hundred pounds. Only special spray guns are adapted to do this work. Even with this equipment the work should be done only in the quietest weather or else the tops will not be reached.

Of course the home owner cannot be expected to own such a machine unless he has a large estate or orchard, and there are only a few of the spray operators who have satisfactory equipment for this work. The writer would suggest that anyone needing this work done should hire an intelligent, dependable operator with the best equipment available instead of the cheapest.

Many of the shade tree pests as well as the garden insects can best be controlled during the next few months. The following are a number of the more important ones to be treated at this time of the year.

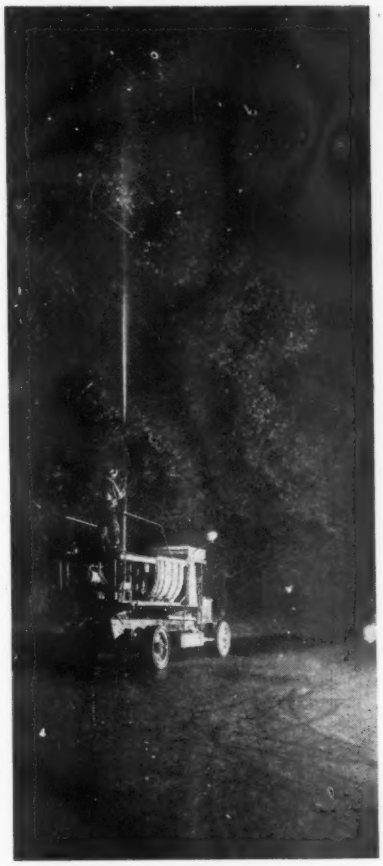
OYSTER SHELL SCALE

The Oyster Shell Scale is brown and the shape of an elongated oyster. It becomes so numerous that an infestation resembles a heavy crust covering the limbs. By the time this encrustation is formed the infested limb is likely to be dead.

This common pest infests a number of shade trees and is especially abundant on English walnut, black walnut, acacia and lilac. It has also killed a great many native alders, poplars, cottonwoods and willows along our streams.

CONTROL

The Oyster Shell Scale is very difficult to control in the dormant period on account of the number of well protected eggs under the heavy shell-like bodies of the females. The simplest time is in the spring soon after the last young have hatched and before the first hatched have grown a heavy coat of armor. There is then a period of a few weeks in May when they may be killed by spraying with one and one-half to two gallons of summer oil, or one and one quarter gallons of summer oil emulsion containing nicotine, per hundred of water.



—Photo by D. B. Mackie,
Calif. State Dept. of Agriculture
Night spraying with a mounted Worthley Gun in Sacramento

SYCAMORE SCALE

This sycamore scale is an interesting species in that the young scale are able to crawl about as usual, the intermediate stages are without legs, and then the adults again attain legs and crawl about similar to mealy bugs.

This scale is found during the winter under the bark scales and in the crevices, covered with cottony wax. As soon as foliage appears the young scales move out onto the under side of the leaves, settle down and soon cause tiny yellowish circles to appear.

CONTROL

Spraying in April with two percent summer oil or one and one-half percent summer oil emulsion containing nicotine, has given very satisfactory control. A good combination to control both the scale and sycamore blight, which causes the foliage to drop once or even twice each season, should be applied twice in the spring. This should consist of two and one-half gallons of summer oil emulsion and

(*Continued on Page* 15)

Oakland Sets The Pace

By EDGAR M. SANBORN
Park Forester, Oakland Park Dept.

THERE are few improvements which add so much to the character, beauty and attractiveness of a city as trees planted along its streets and roadsides—selected, spaced and planted according to approved standards. From our travels we all remember certain cities because of the beautiful trees. The cost is small in comparison to results—so apparent that it is surprising so many cities have neglected this very essential improvement. There have been many spasmodic planting programs but because of improper follow-up, maintenance and control, the good results which might have been achieved have, to a large extent, been nullified.

City Forester Appointed

In May, 1932, the City Council of Oakland, by ordinance placed in the hands of its Board of Park Directors the complete control of its street trees—planting, removal, pruning—and gave it the power to establish rules and regulations to govern the operation and to request passage of ordinances by the Council when desired, in order to better control the tree situation. Immediately, the Board of Park Directors created the position of Park Forester and in effect created a Forestry Division in the Park Department. The Forester was to survey the entire city in regard to the trees already planted, name official trees for planting on all residential streets and develop a planting program for the entire city. The maintenance of all Park and Street trees were also placed under his control.

As there are some 750 miles of paved streets, besides 250 miles of unpaved streets in some of the hill districts and some 500 acres of park lands wooded or planted with trees many years ago, the job loomed large.

In June, 1932, one month later, the work relief program started. The press carried an item that the street trees were now under the control of the Park Department. For days we were deluged with complaints about the condition of trees in every section of the city. Forty to fifty inspections a day were made and twenty relief workers assigned to the Forester. A Tree Surgeon and assistant were appointed and within sixty days a field crew under city supervision with trucks, tools, etc., was in full operation. But we were swamped. Ten regular tree workmen jobs were created, first on an emergency basis and later on a regular basis. This was increased to fifteen and relief workers to around one hundred in a short time.

❖ OFFICIAL STREET TREES ❖

NAME OF TREE	COLUMN 1 Width of Parking A—2 feet or less B—2 to 4 feet C—4 feet or more	COLUMN 2 Co-parative Rating A—Many streets B—Several streets C—Few streets
1. Acer Campestre (Cork Bark Maple)	B	B
2. Acer platanoides schwedleri (Red-leaf Maple)	B	B
3. Acer rubrum (Scarlet Maple)	B	B
4. Acer saccharum (Sugar Maple)	B	B
5. Betula in variety (Birch tree)	A	C
6. Betula alba (European White Birch)	A	C
7. Betula alba laciniata pendula (Cut-leaf Weeping Birch)	A	C
8. Betula pendula (Weeping Birch)	A	C
9. Camphora officinalis (Camphor)	B	A
10. Castanea sativa (Spanish Chestnut)	C	C
11. Cedrus deodara	C	C
12. Ceratonia siliqua (Carob tree)	A	A
13. Crataegus carrieri	A	B
14. Crataegus cordata (Washington Thorn)	A	A
15. Crataegus oxyacantha (Double pink English Hawthorne)	A	C
16. Eucalyptus ficifolia (Scarlet flowering Gum)	B	A
17. Fraxinus velutina (Arizona Ash)	B	A
18. Sorbus aucuparia (European Mountain Ash)	B	A
19. Ginkgo biloba (Maidenhair tree)	B	C
20. Ligustrum japonicum (Japanese privet)	A	B
21. Liriodendron tulipifera (Tulip tree)	C	B
22. Liquidambar styraciflua (Sweet Gum)	B	A
23. Photinia serrulata	B	A
24. Pittosporum undulatum (Victorian Box)	A	B
25. Pittosporum crassifolium	A	B
26. Platanus in variety (Plane tree)	C	C
27. Platanus acerifolia (London Plane)	C	C
28. Platanus racemosa (California Plane)	C	C
29. Prunus pissardi (Purple Leaf Plum)	A	A
30. Prunus blirieana (Purple Leaf Plum)	A	A
31. Prunus ilicifolia (California Evergreen Cherry)	B	C
32. Prunus moseri (Purple Leaf Plum)	A	A
33. Prunus naden (Flowering Cherry)	A	C
34. Prunus nigra (Purple Leaf Plum)	A	C
35. Prunus nune rubra (Red flowering Apricot)	A	C
36. Prunus persica (Pink flowering Peach)	A	C
37. Prunus pissardi (Purple Leaf Plum)	A	B
38. Prunus vesuvius (Purple Leaf Plum)	A	C
39. Quercus agrifolia (Live Oak)	C	C
40. Quercus coccinea (Scarlet Oak)	B	B
41. Quercus palustris (Pin Oak)	B	B
42. Robinia hispidae (Rose Acacia)	B	C
43. Robinia pseudacacia decaisneana (Pink flowering Locust)	B	B
44. Ulmus parvifolia (Chinese Elm)	B	C
45. Ulmus pumila (Siberian Elm)	B	A

Remove Dangerous Trees

There has never been a let-down since the program started. On the contrary there has been a constant increase because of new curb projects, new highways cutting through the city and the regular maintenance and replacements necessary to get the street tree situation under proper control. Thousands of dangerous, dead or unsightly trees have been removed. Some sixteen miles of streets have been planted uniformly. The old planting has been removed and new official trees planted in front of some 3700 residences. In this case the only charge to the property owner is the cost of the new trees. The removal, however, is not done indiscriminately if there are good trees already established on the street. The Park Department removes the old planting and plants, stakes at proper intervals the new official trees without charge to the individual property owner when they supply the trees. On all main boulevards the Park Department supplies the trees also, there being no charge at all to the property owner.

During the five year period just ending, the Forestry Division has pruned or rehabilitated some 65,000 trees we wished to keep on the streets; renovated, cabled limbs, drained or filled cavities of several thousand Park trees. A few figures here may be of some interest.

Total Projects completed during the past five years with Federal aid:

Park Department	$234,787.00
Park Department Street Tree Division	295,502.00
	$530,289.00

In other words, projects completed under the Street Tree Division are greater than projects completed in the Park Department in the city parks.

Public Beauty Minded

I believe this trend is typical of the expansion in all our western cities if highway beautification is allowed to develop naturally. There can be no question but that proper highway beautification will become a more dominant feature in Park Departments than in the past. Planting and care of center strips, planting strips between the main highways and the service roads, triangles and islands left by cutting new highways, planting the face of cuts on both the upper and lower side of hill roads, rounding the top of cuts and possibly small highway parks for a brief rest or light lunch—all these features must receive proper attention if our cities are to present an appearance of beauty and character and if property values are not only to be maintained but enhanced.

Planting Bay Bridge

One of the projects recently completed during the year by the Forestry Division of the Oakland Park Department has been the plant-

(*Continued on Page* 16)

Why Juniors Plant Trees

By KATHERINE A. LANE
(*Founder of the Lane Tree Club*)

PERHAPS many of my readers know how Arbor Day came into existence, but possibly some do not. It was a long time ago, way back in 1872.

When J. Sterling Morton was elected Governor of Nebraska in 1872 he made a pre-election pledge that if voted into office he would plant trees. He more than fulfilled his pledge, planting forty million trees during his incumbency.

Later, in the Centennial year of 1876, Mr. G. B. Northrup, to popularize Arbor Day, promised each child $1 who would plant or help to plant five centennial trees.

Seven years ago we spent a summer in the Middle West and found the state hot and dry with the exception of Nebraska, which had less excessive heat and more rainfall than any of the surrounding states.

I need not tell you why.

REASON FOR TREE CLUB

The reason I formed a tree club was because of the memory of the splendid work Governor Morton had done and because of my interest in the Hollywood Juniors, who have the honor of being the very first juniors in the Los Angeles District Federation of Women's Clubs.

I believe I am justly proud of them for I have seen the movement grow from a struggling infant, as it were, of but thirteen girls, to its present fifty-four clubs and two thousand girls.

It was when I was president of the Hollywood Woman's Club that I first had the idea of the Juniors which, as you shall see, was later directed toward trees. At first the Club turned it down, as I already had introduced French and Browning, and the board thought, perhaps, I was trying to establish too many diverse activities.

In spite of being turned down I kept at it until the third time the idea was accepted. It has since become quite the style to have a Junior Club; indeed, no club is complete without one.

The Juniors took to the idea of tree culture and planting and we have interesting competition annually to see which one will win the twenty-five dollar prize that goes to the club to first plant a block of flowering trees. This year the Norwalk Juniors planted seven blocks.

Four years ago for the first time the Los Angeles Chamber of Commerce organized a Woman's Committee. Several of the Olympic Games' hostesses were appointed to form the Woman's Community Service Auxiliary of the L. A. C. of C., and I was made chairman of Tree Planting.

CHERRY TREES A GIFT

The question was, where and how to get the trees. On my first trip around the world I had visited Japan during their cherry festival and, of course, after seeing these beautiful trees in Washington, D. C., dreamed of doing something about them in Los Angeles, little thinking my dream would come true.

After the Japanese squadron visited our harbor I had an interview with Mr. Sostow, the Japanese consul, and I suggested we would very much appreciate the gift of some cherry trees on the theory that he couldn't any more than say "No."

On the contrary he promptly said "Yes" and referred me to the Japanese Chamber of Commerce who gave 360 cherry trees which are now planted in Griffith Park. The Breakfast Club then gave us a Cherry Tree Morning and Sid Grauman gave us a Cherry Tree Night. Two cherry trees are planted, by the way, in his court.

Later Mayor Shaw was prevailed upon to establish November 18th as Tree Day and with music and ceremony more trees were planted in Griffith Park. Congressman John Steven McGroarty gave an original poem, Lawrence King sang "Trees," and, someday, we hope to have a Cherry Festival all our own.

Mrs. Katherine A. Lane, before a canvas of the Redwoods she completed recently

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GARDEN BULBS IN COLOR: McFarland, Hatton and Foley. 296 pgs. The Macmillan Co., Feb. 15, 1938, $3.50.

Beauty on every page, even though you could not read it would be worth the small price asked. Color printing is ever a miracle and here it is in its highest degree of perfection.

Look particularly for the following cuts: Tulip—Fantasy and Ambrosia; Narcissus—Twink, Whistler and Queen of the North; Lily—speciosum rubrum and auratum platyphyllus (p. 109).

TREES OF YOSEMITE: Tresidder and Hoss. 134 pgs. Stanford University Press, $2.00.

Of special interest to the Dendrologist this book clearly describes and locates the tree species found in and around Yosemite. Artistically the linoleum block cuts are beautiful, but for accuracy in identifying species they are useless because neither the number of leaves to the bundle, the details of bark, etc., are discernible. The text is well done and very worth while.

Lake States Tree Ranges

By EUGENE I. ROE
Lake States Forest Experiment Station, University Farm, St. Paul, Minn.

KNOWLEDGE of the extreme limits of range of our forest trees, although seemingly of only academic interest, is nevertheless of considerable practical value to the forester, the horticulturist, the tree lover, and to those interested in wild-life management. Since the general distribution of plants is limited by such climatic factors as temperature, precipitation and atmospheric humidity, there is no better evidence as to the locality in which a tree can be safely grown than that furnished by its own natural occurrence.

Where a species is native, its propagation involves little risk; in areas where it does not occur naturally, however, its culture is likely to be a failure due to climatic extremes to which it cannot adjust itself. Although trees can be grown outside their natural range for some years with apparent success, there is no assurance that such conditions as severe drought or extremely high or low temperatures will not eventually cause heavy loss.

For this reason it is highly important that the complete range of each of the forest trees growing within a given region be available to all persons concerned with tree culture within that region. Since the range as given by Sudworth, (1) however, is rather general and for many species is far from complete, there is still considerable work to be done before this goal can be reached. A good example of how information of this kind may be easily gathered together is furnished by the appended table which consists of notes representing extensions in the range of certain Lake States trees.

How Notes Were Taken

These notes were collected by the author and some of his co-workers incidental to their regular field duties or as data to be used for other research studies. They hence represent no particular outlay of time. It is, therefore, believed that if foresters and other technicians engaged in similar field work, such as biologists, soil conservationists, etc., were to make note of all occurrences of tree species differing markedly from the published records, we would soon accumulate a great deal of useful information on tree distribution. And with a minimum of effort. In due time detailed maps could be prepared from such data, these supplanting the more general tree range maps which have been prepared for many American trees under the direction of the late Mr. Sudworth.

All notes on tree distribution should be supplemented whenever possible by the collection of typical specimens. This is of great importance from the standpoint of verifying the records. Specimens may be sent in for identification to the National Herbarium at Washington, D. C., or to the botany departments of almost any of our universities or colleges.

(1) The nomenclature used in the table follows that of the "Check List."

DISTRIBUTION CHART

SPECIES—	LOCATION Sec.	Twp.	Rge.	County	State	Observer	Date	Remarks
Acer negundo L.		64N	20W	St. Louis	Minn.	R	Aug. '34	Near Orr
(Box elder)		52N	40W	Ontonagon	Mich.	R & K	Aug. '30	Along Ontonagon R.
	4	53N	33W	Houghton	Mich.	R	Oct. '37	Along Sturgeon R.
A. pennsylvanicum L. (Striped maple)	29	52N	30W	Baraga	Mich.	R	Sept. '37	
A. saccharinum L.		48N	16W	Carlton	Minn.	R & K	June '30	Along St. Louis R.
(Silver maple)		52N	40W	Ontonagon	Mich.	R & K	Aug. '30	Along Ontonagon R.
		46N	36W	Ontonagon	Mich.	R & K	Aug. '30	Near Bond Falls
	4	53N	33W	Houghton	Mich.	R	Oct. '37	Along Sturgeon R.
		61N	26W	Itasca	Minn.	R	Aug. '31	Along Big Fork R.
Betula nigra L. (River birch)		21N	4W	Jackson	Wis.	R	Aug. '31	Black River Falls
		16N	3E	Juneou	Wis.	R	Oct. '34	New Lisbon
Carpinus caroliniana Walt. (Blue beech)		58N	29W	Keweenaw	Mich.	R	Oct. '30	Near Copper Harbor
Cornus alternifolia L. (Blue dogwood)	35	162N	39W	Roseau	Minn.	R	Sept. '34	
Hamamelis virginiana L.	2	38N	12W	Washburn	Wis.	G	July '31	
(Witch hazel)	16	37N	28W	Menominee	Mich.	K	July '26	
	12	27N	11W	Grand Traverse	Mich.	K	Sept. '26	
Hicoria cordiformis (Wang.) Britt. (Bitternut hickory)	10	33N	20E	Marinette	Wis.	R	Aug. '30	
Juglans cinerea L.								
(Butternut)	10	33N	20E	Marinette	Wis.	R	Aug. '30	
		136N	27W	Crow Wing	Minn.	L	July '32	E. shore, Up. Mission L.
Liriodendron tulipifera L. (Yellow poplar)	1	10N	4E	Saginaw	Mich.	H	Jan. '35	
Morus rubra L. (Red mulberry)		21N	4W	Jackson	Wis.	R	Aug. '31	Black River Falls
Quercus alba L.								
(White oak)	31	36N	20E	Marinette	Wis.	R	Aug. '30	
		25N	9E	Alcona	Mich.	R & K	Aug. '30	
Q. borealis Michx. f.								
(Red oak)		58N	6W	Lake	Minn.	K	May '30	Near Cramer
		59N	28W	Keweenaw	Mich.	R	Oct. '30	Ft. Wilkins State Park
Q. ellipsoidalis E. J. Hill								
(Jack oak)		151N	35W	Beltrami	Minn.	R	Sept. '34	S. shore Lower Red L.
		62N	15W	St. Louis	Minn.	R	Sept. '34	Jasper Peak
Q. macrocarpa Michx.								
(Bur oak)		48N	38W	Ontonagon	Mich.	R & K	Aug. '30	
	3	48N	42W	Ontonagon	Mich.	R	Oct. '37	
Q. velutina LaM.	13	65N	14W	St. Louis	Minn.	LeB	July '35	
(Black oak)	15	26N	3E	Oscoda	Mich.	K	Sept. '26	
	11	27N	11W	Grand Traverse	Mich.	K	Aug. '26	
	21	21N	10E	Portage	Wis.	R & K	Sept. '30	
Ulmus racemosa Thomas						R & K		
(Rock elm)		52N	26W	Aitkin	Minn.		June '30	Hill City
	25	35N	21E	Marinette	Wis.	R	Aug. '30	

R—Author; K—Joseph Kittredge, Jr. G—S. R. Gevorkiantz; H—C. J. Holcomb; L—Thomas Lotti; Leb—R. K. LeBarron

Authors and Book Reviews

TEXTBOOK OF DENDROLOGY: Harlow and Harrar. 527 pgs. 224 illus. McGraw-Hill Book Co., $4.50.

The authors of this excellent text accomplished what they set out to do. The most important conifers and broadleaf trees in forestry practice are thoroughly described. The illustrations are beautifully clear and profuse. One of the most interesting departures is the word pictures of the trees. Silvical data and anecdotes written in the most entertaining manner make the reading easy and help to place this book close to the top of American dendrologies.

The authors may have had in mind catering solely to foresters, but Western arborists, park men and landscape architects will find it an invaluable source of information on tree species that they use or come in contact with in their work. This book cannot be praised too highly. Will be in every library, because of the information on enemies of many trees used, particularly on the West Coast, ornamentally.

T. H. Harris, University of California '27, Forestry; Master degree, U. of Idaho '30. At present with U.S.D.A., assistant in charge of blister rust checking in California and Oregon.

Frank B. Herbert, entomologist with the Balfour Guthrie Co., Ltd., San Jose. For many years with the U. S. Dept. of Agriculture. A member of the Western Shade Tree Conference.

FOREST INSECTS: Doane, Van Dyke, Chamberlin & Burke. 463 pgs. 234 illus. McGraw-Hill Book Co., $4.50.

Covers the more important coniferous and broadleaf trees in the U. S. and their principal insect enemies. The first chapter covers in a general way the importance of entomology in forest conservation; the despoilation of valuable recreational areas from insect attacks and an unusual recommendation that control methods such as those used by park men and arborists be employed in such areas. Very sound advice.

The next three chapters treat of control. Chapters follow on Beetles (3), Moths and Butterflies (1), Sawflies, Horntails, Bees and Ants (1), Aphids, Scale insects and others (1), finishing with a chapter on Termites and White Ants.

A valuable appendix lists the more important trees and their principal enemies. Of value to the arborist and park administrator

FOREST PROTECTION, by Ralph C. Hawley. 262 pgs. John Wiley & Sons, 1937, $2.75.

This meaty text is patterned on the lines of the German text of Hess "Der Forstschutz" that was translated into English by Nesbet and served as a compendium on the subject for many years. There are no illustrations but adequate bibliographies are given at the end of each chapter.

Leslie S. Mayne, new president of the Bay Counties Tree Surgeons and Pest Control Operators Ass'n. Graduate in Forestry, Cambridge University, England, '24. Now a consulting arborist in Palo Alto and member of Western Shade Tree Conference.

The subject is divided into seven general classes of injurious agencies: Man, Atmospheric Agencies, Plants (including Fungi, Mistletoe and Forest Weeds), Insects, Domestic Animals, Wildlife and Forest Fires.

Nearly half the book (115 pages) is devoted to fires, their effects and character, causes, presuppression activities in control, suppression, costs, plans and insurance. In five pages man is castigated for carelessness in introducing various insects and fungi, allowing stock to graze without regulation, liberating poisonous fumes from manufacturing plants, and in general for poor judgment in many things silvicultural, but is fully exonerated from the defects of climate.

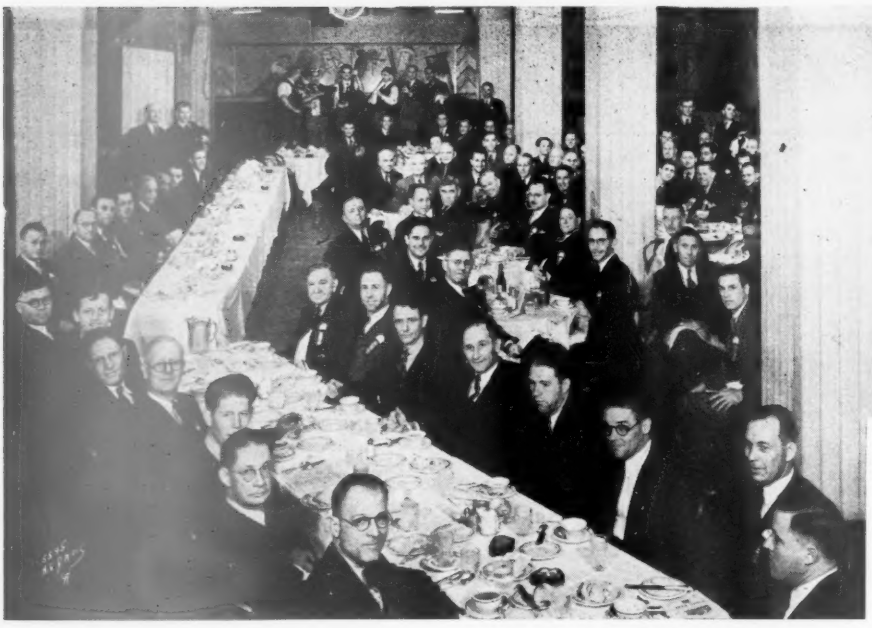
Under atmospheric agencies comes 39 pages of discussion, largely confined to the deleterious effects of heat, cold, precipitation and wind, although smoke, poisonous gases and lightning are given some attention. Entomology claims 28 pages and pathology 16. The discussions are very general and the forest pathologist might take exception to such a statement as "The fungi which attack the growing forest are parasitic in nature" (p. 54). He is accustomed to think of heart rots as organisms largely growing in dead tissue and hence more in the nature of saprophytes. By courtesy he calls them "wound parasites" when considering the tree as a living entity. Very few have the capacity to attack actively functioning sapwood.

Warren V. Benedict, Oregon State College '24, Forestry. Director of blister rust work in California and Oregon for the Bureau of Entomology and Plant Quarantine in the U.S.D.A.

The chapters on grazing injury by domestic animals and deer and the unfavorable activities of beaver, rabbits, squirrels, rodents and birds are quite adequately covered in 34 pages.

The book is an excellent treatise worthy of a place on every forester's shelf.

—Reviewed by Dr. C. J. Humphrey.



The Annual Conference of the California Section of the American Society of Foresters, held in Southern California for the first time January 3, 1938, was well attended as the picture shows.

(*Continued from Page* 5)

abundance and infecting capacity of the Ribes in the pine stand. Blister rust is not spectacular like a forest fire, but it works insidiously, and in some respects is worse than fire. Fire destroys all species on restricted areas but does not preclude the future growth of these species on these areas. Blister rust is restricted to white or five-needled pines but unrestricted as to area and inhibits the future growth of the species attacked. It might be compared to a slow ffre that burns continuously all year long, year after year.

Sugar pine is the most susceptible of the commercially important white pines. In addition to the high susceptibility of sugar pine, the California Ribes are among the most susceptible Ribes to blister rust. This combination of favorable hosts may well mean that the rust will intensify at a tremendous rate in California once infection becomes well established. If blister rust is not controlled, sugar pine as a timber crop and as an aesthetic tree may be expected ultimately to disappear from the forests of California.

The early stages of infection are inconspicuous and the extent of its damage is often underrated. By the time damage is readily discernible to the average observer it is too late for control work to be fully effective. It is for this reason that it is important to complete control work in the sugar pine stands of California before the rust becomes too widespread. If control work is going to be done, every effort should be made to complete the job before many of the pines become infected and therefore killed. Ribes eradication will stop the formation of any new infection but their removal will not prevent the loss of trees that become infected before the Ribes are destroyed.

Impossible to Work Out

Because of the manner in which the disease is disseminated over long distances from pines to Ribes, there is no possible way to eradicate it once it becomes established in a region, as is now the case in northern California. Furthermore, there is no practicable way to prevent its further southward spread. Fortunately, however, the disease can be controlled. Blister rust is a rare example of a highly infectious disease that is subject to complete control.

How is blister rust controlled? By breaking its life cycle at the weakest point. That point is the currant and gooseberry host from which it can spread not more than 1000 feet to pines. Effective control is established through the eradication of all currant and gooseberry bushes growing in the sugar pine stand it is desired to protect, and in a strip 1,000 feet wide surrounding it. In California the bushes are removed principally by hand-grubbing; to a small extent chemicals are used to spray dense patches of bushes that represent difficult and expensive hand work. Where currants and gooseberries are abundant, one or two subsequent coverings of the area at regularly spaced time intervals are necessary in order to remove new bushes originating from seed in the soil.

What has been done in California to control this pest? Under the leadership of the Bureau of Entomology and Plant Quarantine cooperating with the Forest Service of the U. S. Department of Agriculture, and other public agencies, control work has been in progress for several years. Currants and gooseberries have been removed from 465,000 acres of sugar pine timberland at an average cost of $3.23 per acre. In other parts of the country control work has been under way much longer, long enough to demonstrate conclusively its effectiveness by comparison of protected areas with unprotected areas. A large part of this work has been accomplished by the Federal Government under its program of emergency work relief.

What remains to be done? Less than one-fourth of the control job has been finished; 1,700,000 acres of California's choicest sugar pine timber still remain unprotected. White pine blister rust, a foreign scourge of our forests, has crossed our borders and is attacking and killing our most valuable timber tree; if not controlled it will ultimately remove sugar pine from our forests. The spread of blister rust is rapid, its work insidious, and its host in California extremely susceptible to attack. In the conservation of our natural resources, can we afford to neglect sugar pine?

(*Continued from Page* 10)

ing of the approaches and around the distribution structure of the San Francisco-Oakland Bay Bridge. Some fifty-two large Monterey Pines and Deodars twenty-five to thirty-five feet high and weighing when boxed four to six tons, were planted. Along Cypress Street and Moss Avenue running out from the approaches some three and one-half miles have been planted to Live Oak, Chinese Evergreen Elm and Eucalyptus ficifolia. As ground covers in the center strips Cotoneaster microphylla, horizontalis and here and there Pyracantha yunanensis were used. The cost of the entire project was approximately $70,000.00 and some four thousand shrubs and trees were planted. At the Distribution Structure the planting conditions because of cutting ocean winds and salt marshy lands, were particularly adverse.

Besides our regular program, the large project for the coming year is planting the approaches to the Broadway Low Level Tunnel connecting Oakland and Contra Costa County —a four and one-half million dollar bore completed in December, 1937. It is the intention to intensify the natural planting along the roadside and hillsides with Live Oak, Toyon, Monterey Pine and other natives at this approach.

In the general program we are eliminating as quickly as possible such street trees as Black Acacias (Acacia Melanaxylon), Lombardy, Carolina and Silver Poplars, Cork Bark Elms, Dracaena Palms, Walnut and Pepper trees, and all other large trees that have been planted on too narrow a planting strip. Street trees in Oakland are planted for ornamental purposes only—not for shade.

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(*Continued from Page* 9)

twenty pounds of Bordeaux Mixture for each hundred gallons of water. The first application should be applied when the buds start swelling and again two to three weeks later. Three pounds of Standard Arsenate of Lead should be added to the second application for the control of the sycamore leaf blotch miner which also plays a part in destroying the foliage.

Other Scale Insects

Many other scale insects ruin the thrift and beauty of our trees. The European elm scale is one of our worst pests extending from Vancouver, B. C. and Spokane to Southern California and from the coast to Colorado (also throughout the east and middlewest).

Mealybugs infest trees throughout the warmer portions of the west. The Golden Mealybug is often abundant on araucarias. Red scale, purple scale and black scale attack many of our street trees, especially in Southern California.

All of these except black scale can be controlled by spring spraying, using two gallons of summer oil emulsion per hundred of water. Emulsible oils containing special toxics are best for the red and purple scales. Two applications, four weeks apart, may be necessary for these two species. Nicotine added to summer oil will show the best control of mealybugs. Black scale should be treated in the summer or early fall.

The Elm Leaf Beetle

This black striped yellow beetle and its larvae are doing damage to elm foliage in an increasing number of localities each season. It now extends from Southern California to Washington on the west coast. In the Sacramento Valley probably more spraying is being done for the control of this pest than for all other shade tree pests combined.

The beetles appear and begin feeding on the foliage soon after leafing occurs in the spring and newly hatched larvae begin to feed in May, often completely skeletonizing the leaves. Other broods appear during the summer. The full grown larvae will often be noticed at the base of the tree when they crawl down to pupate in the soil or under debris.

Control is very effective if done before the larvae reach maturity. This is best accomplished in April or early May, using four pounds of standard arsenate of lead per hundred gallons of water. On these tall trees it is especially necessary to have large spray equipment.

The Tingids or Lacebugs

These are interesting little insects belonging to the true bug family. They are called lacebugs on account of the reticulated or lace like effect of the square shaped wings and hood of the adults.

Among the worst of these is the California Christmas berry tingid which attacks the leaves of toyon, making them very unsightly. The upper surface of the leaves is scarred similar to thrips work and the under surface is also covered with black spots of excreta and egg masses. The leaves lose their bright green lustre and soon take on a dead yellowish cast after being attacked.

The Western Sycamore lacebug attacks sycamores and the Arizona ash tingid infests ash and poplars in Arizona and Sacramento and San Joaquin Valleys of California. These species are similar to the one on Christmas berry and cause much the same trouble.

The best control for these is spraying in May with a combination of summer oil emulsion, one and one-half gallons, and nicotine sulfate, one half pint, per hundred gallons of water. The undersides of the leaves must be thoroughly treated.

Caterpillars

There are many caterpillars present in the

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spring feeding on foliage. The oaks suffer more than most of the other trees. One of the worst of them is the California oak worm, which feeds on coast live oaks in the spring and on all coast oaks in the fall.

The forest tent caterpillar and the California tent caterpillar also feed on all species of oaks in the spring. They are bright colored woolly caterpillars. The tussock caterpillars with bright colored tufts on their backs attack many species of trees including oaks and fruit trees.

In Oregon, Washington and British Columbia, one of the worst defoliators is the oak looper. It is as much of a pest in that region as the California oak worm is in central and southern California. The caterpillar is yellow brown with a fine black line on each side.

Other spring defoliating caterpillars include the spring cankerworm, the oblique banded leaf-roller, the omniverous looper, the yellow-necked caterpillar, the red-humped caterpillar and a great number of others. They all feed on shade trees and many on fruit trees.

CONTROL

These caterpillars can be controlled in the spring after the deciduous trees have attained most of their foliage. The tussock caterpillars and the leaf-rollers are the most difficult to poison. The usual recommendation is standard arsenate of lead at the rate of four or five pounds per hundred gallons of water. Other arsenicals may be substituted but most are not as satisfactory nor as quick acting. A gallon of summer oil or three pounds of green water paint may be added to each hundred gallons to make the residue much less noticeable.

APHIDS

Aphids of many different colors infest our shade trees, making them sticky and unsightly. When severe they even cause defoliation, such as the dark green hawthorn aphis on hawthorn. The linden aphis is yellowish black and causes many a linden to become unsightly and drip with honeydew. Birch trees suffer from infestations of the common birch aphid, willows from the giant willow aphid, Monterey pines, yellow pines and Douglas firs from the Monterey pine aphid, elms from the elm gall, leaf curl and woolly elm aphids, oaks from the cloudy winged oak aphid, the woolly oak aphid, the oak bud aphid, the live oak bark aphid, etc. Many of the maples, sycamores, walnuts, arbor vitae, cypresses, poplars, shrubbery and roses, in fact most any trees or plants you name are infested in the spring with aphids.

CONTROL

These are best controlled with a spray consisting of one to one and one-half gallons of summer oil, either containing nicotine, or with three-quarters of a pint of nicotine added per hundred gallons of water. Pyrethrum may be substituted for the nicotine.

THRIPS

Several species of thrips attack a number of shade trees, scarring, yellowing and gnarling the leaves. Among the worst of these are the Christmas berry thrips on toyon, and the greenhouse thrips on many shade trees, including laurel, laurestinus, maple and Norfolk Island pine. They should be sprayed the same as for aphids.

GENERAL CONTROL

Most of the spraying recommended consists of arsenate of lead for the caterpillars and defoliating beetles, summer oil for the scale insects and summer oil containing nicotine or pyrethrum for the other sucking insects. Other pests not mentioned but which may be of importance to certain individuals will most likely fall into one of these groups.

It is our sincere hope that this article may arouse a greater interest in our shade trees and a greater determination to make them have longer life and greater beauty.

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